airplane action display imagery employed in the game of **FIG. 5**). In addition, some elements might cross over to non game activity as well

[0694] A flow chart illustrating some of the above steps is shown in **FIG. 24** Steps are as follows

[0695] A. Load Test and diagnostic software into computer and put object desired in front of TV camera system at typical distance.

[0696] B. Determine which if any feature of object is usable as a target datum or if image of a bulk portion of the object (such as head) can be used

[0697] C. If added targets are needed per software instruction, affix targets per instruction at recommended locations for the object and game or other activity

[0698] D. Test these targets using tv camera system, determine if must be replaced or moved or added targets put on

[0699] E. If targets needed to be changed do so and retest

[0700] F. Run game with first settings determined

[0701] G. Test target s in computer model of game, determine if need changes

[0702] H. If so make recommended changes and retest. Changes can be to lighting, target type, target location, camera parmeters, photogrammetric equations, background, etc.

[0703] I. Test by moving object in to different positions, orientations and velocities recommended by the game program,

[0704] J. If changes suggested, make and retest (optional—one might acquiesce to poorer performance just to get started)

[0705] K. Play game one or more times

[0706] L. IF desired, record key parameters (target brightness, velocities, ranges in position and orientation, backgrounds etc) for further analysis

[0707] M. When game finished analyze further and determine changes if any.

[0708] For a pre-made object, idealized for the game, most of the initial steps are unnecessary as long as recommended game settings, light, camera and other parameters are adhered to and surroundings are satisfactory. None the less the test program can be used to optimize these as well.

[0709] **FIG. 25**

[0710] **FIG. 25** illustrates a game experience with an object represented on a deformable screen. As has also been discussed, one can physically interact with the object screen. For example, if one actually touches the screen, one can deform the screen and measure its deformation. This was described in copending application Ser. No. 08/496,908 incorporated by reference, including physically measuring the indication of deformation of the backside of the screen.

[0711] But it can also be done by using target grids on the screen which may only be viewable by infrared means, but where the actual screen itself is physically measured from the front side or the backside, as was described in the previous application.

[0712] A boxing dummy such as **2515** represented as an image on the screen, that one actually hits and deforms is possible using the invention if one considers the screen to be the deformable object. In this case perhaps it is not necessary to actually encode the deformation in the screen **2520** but assume a deformation since one knows where one hit it, by determining a target or other feature position such as **2525** on the hitting object such as boxing glove **2530**, observed by camera system **2535** whose images are processed by computer **2540** to obtain glove position. Display processor **2545** uses this glove position data, to modify a computer modeled 3-D data base of an opponent stored in a data base **2550**, and drive display **2560**, for example providing said display on a large rear projection tv screen **2565**.

[0713] For example, consider where the screen itself is a deformable membrane. In the copending Ser. No. 08/496,908 invention, the screen deformation upon physical contact was measured and used as an input to the game. In this case however, I have illustrated an alternative situation where one determines from position of the object making contact where the hit occured and if desired, the motion involved in the hit(ie its velocity and or trajectory obtained by tracking the targeted glove just before it hit it (which leads to its force and direction of contact using the targeted extremities of the player, in this case playing at boxing (or karate, for example in an another embodiment where feet and hands would be so determined and tracked, for example—elbows too if desired).

[0714] In this case, one simply calculates an estimated effect upon the dummy, which in this case is actually fought by the user in terms of the resistance of the screen. It isn't totally lifelike but it is at least a physical response and, if desired, the image of the dummy goes down or recoils or doubles up in pain or whatever (note in this case the projection should desirably be on a flat or slightly curved screen, not a highly curved one which would not have the right shape in more than one position). None of this is very pretty but it sells games!

[0715] The actual actions can be modeled in a computer program capable of providing a 3D rendered display for near life like representation of the result of an action. This would apply to sword fights, soccer games, and other activity described in this and related applications. For example using a targeted sword, rather than a boxing glove, one can physically slash a real life-size opponent represented by an image on a screen and, since one knows where the slash occurs on the projection tv image by virtue of the target point determination of the sword tip using the camera system of the invention, blood representation can emerge from the screen image, or a simulated head falling off or whatever.

[0716] Throwing things need not be bloody. As has been mentioned above and in the applications incorporated by reference, all kinds of sports possibilities exist, such as:

[0717] Hitting sports, baseball, cricket, boxing,

[0718] Throwing and firing sports such as baseball, shooting, archery, etc. Football (American), football (soccer), hockey, field hockey, lacrosse, etc. played with goalies in the goal.